THE AUSTRALIAN ASSOCIATION OF MATHEMATICS TEACHERS

Standards for Excellence

in Teaching Mathematics in Australian Schools

2006 edition

These *Standards* were originally adopted by AAMT Council in 2002 as representing a consensus view, by the profession for the profession, describing the knowledge, skills and attributes required for good teaching of mathematics. Their statement in this 2006 interim version (see last page for an explanation) is exactly the same as in the original publication, and is accompanied by a range of materials designed to elaborate their meaning. These materials can be found at **www.aamt.edu.au** (follow the links to "Standards").

The AAMT *Standards* relate to the specialised professional work of teaching mathematics and are not intended to describe the characteristics and attributes of excellent teachers in general.

The AAMT Council expects that all teachers of mathematics:

- have qualifications appropriate to the grade level and/or mathematics they teach;
- behave, and carry out their duties in a responsible and ethical manner; and
- have a personal philosophy of teaching and learning that is evident in their classroom practice.

Uses of the AAMT Standards

The AAMT Council encourages professionally supportive uses of the *Standards* by individuals, groups, institutions and organisations. The Council does not support their use, in whole or in part, in any performance management systems for teachers.

As standards for excellence, the AAMT *Standards* provide targets to which all teachers of mathematics can aspire and work towards in their professional development. For those teachers who wish to be acknowledged as reaching the high standards described by the *Standards*, the AAMT has designed, tested and established the program of assessment that allows them to be awarded the AAMT's **Highly Accomplished Teacher of Mathematics** credential. Details of this program are available at **www.aamt.edu.au** (follow the links to "Standards"). This is the only program of assessment and accreditation against the *Standards* that is endorsed by the AAMT.

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DOMAIN 1: PROFESSIONAL KNOWLEDGE

Excellent teachers of mathematics have a strong knowledge base to draw on in all aspects of their professional work, including their decision making, planning and interactions. Their knowledge base includes knowledge of students, how mathematics is learned, what affects students' opportunities to learn mathematics and how the learning of mathematics can be enhanc-ed. It also includes sound knowledge and appreciation of mathematics appropriate to the grade level and/or mathematics subjects they teach.

1.1 Knowledge… of students

Excellent teachers of mathematics have a thorough knowledge of the students they teach. This includes knowledge of students' social and cultural contexts, the mathematics they know and use, their preferred ways of learning, and how confident they feel about learning mathematics.

1.2 Knowledge… of mathematics

Excellent teachers of mathematics have a sound, coherent knowledge of the mathematics appropriate to the student level they teach, and which is situated in their knowledge and understanding of the broader mathematics curriculum. They understand how mathematics is represented and communicated, and why mathematics is taught. They are confident and competent users of mathematics who understand connections within mathematics, between mathematics and other subject areas, and how mathematics is related to society.

1.3 Knowledge… of students' learning of mathematics

Excellent teachers of mathematics have rich knowledge of how students learn mathematics. They have an understanding of current theories relevant to the learning of mathematics. They have knowledge of the mathematical development of students including learning sequences, appropriate representations, models and language. They are aware of a range of effective strategies and techniques for: teaching and learning mathematics; promoting enjoyment of learning and positive attitudes to mathematics; utilising information and communication technologies; encouraging and enabling parental involvement; and for being an effective role model for students and the community in the ways they deal with mathematics.

DOMAIN 2: PROFESSIONAL ATTRIBUTES

Excellent teachers of mathematics are committed and enthusiastic professionals who continue to extend their knowledge of both mathematics and student learning. They work creatively and constructively within a range of 'communities' inside and beyond the school and set high, achievable goals for themselves and their students. These teachers exhibit personal approaches characterised by caring and respect for others.

2.1 Personal attributes

The work of excellent teachers of mathematics reflects a range of personal attributes that assists them to engage students in their learning. Their enthusiasm for mathematics and its learning characterises their work. These teachers have a conviction that all students can learn mathematics. They are committed to maximising students' opportunities to learn mathematics and set high achievable standards for the learning of each student. They aim for students to become autonomous and self directed learners who enjoy mathematics. These teachers exhibit care and respect for their students.

2.2 Personal professional development

Excellent teachers of mathematics are committed to the continual improvement of their teaching practice and take opportunities for personal professional development. They undertake sustained, purposeful professional growth in their own knowledge, understanding and skills in mathematics, and in the teaching and learning of mathematics. The professional development they undertake enables them to develop informed views about relevant current trends (including teaching and learning resources, technologies, and changes to the curriculum with which they work) and to further their teaching expertise. They are involved in professional development processes that include collegial interaction, professional reading and active exploration of new teaching ideas, practices and resources in the classroom. They reflect on practice and the new knowledge they gain, and learn from their experiences.

2.3 Community responsibilities

Excellent teachers of mathematics are active contributors to the range of communities relevant to their professional work. They are positive advocates for mathematics and its learning in the school and the wider community. They ensure effective interaction with families including provision of information about students' learning and progress. They offer strategies for assisting students' mathematical development outside the classroom. They create and take opportunities to involve students in mathematical activities beyond the classroom in contexts of interest and relevance to the students. They contribute to the improvement of mathematics teaching by actively engaging and collaborating with colleagues both individually and in teams – learning; sharing insights, practices and resources; supporting and mentoring others; and providing feedback. They actively participate in school decision-making.

DOMAIN 3: PROFESSIONAL PRACTICE

Excellent teachers of mathematics are purposeful in making a positive difference to the learning outcomes, both cognitive and affective, of the students they teach. They are sensitive and responsive to all aspects of the context in which they teach. This is reflected in the learning environments they establish, the lessons they plan, their uses of technologies and other resources, their teaching practices, and the ways in which they assess and report on student learning.

3.1 The learning environment

Excellent teachers of mathematics establish an environment that maximises students' learning opportunities. The psychological, emotional and physical needs of students are addressed and the teacher is aware of, and responds to, the diversity of students' individual needs and talents. Students are empowered to become independent learners. They are motivated to improve their understanding of mathematics and develop enthusiasm for, enjoyment of, and interest in mathematics. In an inclusive and caring atmosphere of trust and belonging, active engagement with mathematics is valued, communication skills fostered, and co-operative and collaborative efforts encouraged.

3.2 Planning for learning

Excellent teachers of mathematics plan for coherently organised learning experiences that have the flexibility to allow for spontaneous, self-directed learning. These learning experiences involve substantive mathematics. They enable students to develop new mathematical understandings that build on and enrich their knowledge and appreciation of mathematics. A variety of appropriate teaching strategies is incorporated in the intended learning experiences, enhanced by available technologies and other resources. Students' backgrounds and prior mathematical knowledge are taken into account. Students are provided with opportunities to explore and apply mathematics across key learning areas and beyond the school setting.

3.3 Teaching in action

Excellent teachers of mathematics arouse curiosity, challenge students' thinking, and engage them actively in learning. They initiate purposeful mathematical dialogue with and among students. As facilitators of learning, excellent teachers negotiate mathematical meaning and model mathematical thinking and reasoning. Their teaching promotes, expects and supports creative thinking, mathematical risk-taking in finding and explaining solutions, and involves strategic intervention and provision of appropriate assistance.

3.4 Assessment

Excellent teachers of mathematics regularly assess and report student learning outcomes, both cognitive and affective, with respect to skills, content, processes, and attitudes. They use a range of assessment strategies that are fair, inclusive and appropriate to both the students and the learning context. They maintain on-going, informative records of student learning outcomes that are used to map student progress and to plan appropriate future learning experiences. The excellent teacher of mathematics provides constructive, purposeful and timely feedback to students and their parents, and to school authorities, as required.

"effective schools are only 'effective' to the extent that they have 'effective' teachers"

About the AAMT Standards

This statement of *Standards for Excellence in Teaching Mathematics in Australian Schools* was adopted by the Australian Association of Mathematics Teachers at its Council Meeting in January 2002. It is therefore the national consensus of the profession — teachers — that describes the knowledge, skills and attributes required for good teaching of mathematics.
The *Standards* are organised into three domains:

- Professional knowledge
- Professional attributes
- Professional practice.

Each of these is shaped by and inter-related to the others. The *Standards* do not seek to advantage a particular style or approach to teaching — diversity is necessary and encouraged through the *Standards*. The AAMT is committed to high standards, not standardisation.
Taken as a whole, the *Standards* materials are a framework for teachers' career-long professional growth. Since their adoption by the Council, AAMT members and staff have undertaken a program of research and development to identify ways in which the *Standards* can support teacher learning and acknowledge those who are working at the level described.

This version of the AAMT Standards

This document is the 2006 edition. The text — the actual *Standards* — is exactly the same as adopted by the AAMT Council in 2002. One thing that has changed is the layout — the *Standards* are now on a two-page spread that allows easier reference to, and display of, the whole. The other is that the explanatory material has been modified somewhat to better reflect the current situation.

What comes after the 2006 edition?

Good teaching of mathematics is dynamic, and the *Standards* need to respond to developing knowledge about the field. In keeping with this, the AAMT Council, at its January 2006 meeting, decided that the *Standards* document should be thoroughly reviewed during 2006.
A revised version will then be able to be adopted from 2007 for several years.
All members of the AAMT are encouraged to contribute to the review and revision processes. Go to **www.aamt.edu.au** and follow the links to "Standards" for more information and to find out how you can be involved.

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